Team: Thanks for your question: **Are organizations stretching their endpoint device lifecycles further now, beyond the historical 2-3 years?** Does current data suggests that it is reasonable to lengthen the traditional 3 year refresh cycle for laptops and PCs? Data from actual practitioners in mainstream companies will be of highest value in reviewing this subject.

There is no single statistically-credible source that addresses this specific question, but we do have a number of data sources/points that will be useful in determining this:

1. Trend lines in refresh rate data in large and mid-size organizations (from Computer Economics)
2. Updated useful life guidelines by the American Hospital Association (published 2018)
3. Data from the IRS internal guidelines (reviewed 2018)
4. Latest available data on laptop failure rates (Consumer Reports, winter 2017)
5. Data on laptop replacement plans (Cascade Asset Management, 2019)

BACKGROUND. Historical Refresh Rates

Although there are no major TCO/refresh cycle studies of traditional endpoints from the 2016-2019 timeframe, industry studies over the past 15 years have documented that the best time to refresh an endpoint is before it turns 4 years old.

DATE	GROUP	FOCUS	SOFT COSTS	RECOMMENDED REFRESH
Sep 2003	Giga	Standardization; costs and risks	No	3 years
Jan 2004	Intel	Very hard costs	No	3 years
Mid 2004	AT Kearny/Intel	Costs to provide outsourcing	Yes	3 year, forklift
Nov 2004	Forrester	Survey data	No	3 years
Late 2004	Wipro	Standardization	No	2-3 years
Dec 2005	Robert Francis Group	Very hard costs, plus NPV	No	3 years
Dec 2007	Gartner	Technology substrate	Yes	2-5 years (varies)
Mar 2009	Gartner	Better management	Yes	4-5 years (via exception)
Mar 2009	Gartner	Laptop repair costs	No	3 years (laptops)
May 2009	Intel	Notebook support costs	No	3-3.5 years (notebooks)
May 2009	Wipro	Age of units in installed base	No	3 years
Nov 2009	Square Trade	Consumer laptop repair rates	No	3 years; not stated
Mar 2010	Experture	Hard costs only; includes leasing	No	36-38 months
Jan 2011	Microsoft	PC vs. VDI	Yes	No more than 4 years
Early 2011	Intel/Grant Thornton	Productivity	Yes	2 years (laptops)
May 2012	IDC	XP/ WIN 7 support	Yes	3-3.2 years
Mar 2013	Gartner	Annual averages	Yes	No more than 4 years
Aug 2013	Gartner	Notebook TCO (adjustments)	Yes	3 years
Jan 2014	Intel	Productivity	Yes	Less than 3 years
Aug 2014	J. Gold Associates	User productivity vs. tech costs	Yes	2 years
Jan 2015	IDC	IT support costs	No	3 years
Mar 2015	Principled Technologies	Productivity	Yes	Less than 5 years
Sept 2015	Gartner	Use case-based lifespans	Yes	2-3+

These studies constitute a large body of accumulated experience, and unless there are indications in recent data or trends to suggest that things are otherwise, refresh policy should be based on this solid mass of data.

ONE. Refresh Rates and Spend from Computer Economics

Computer Economics publishes their *IT Spending and Staffing Benchmarks* each year, based on actual survey data from their client base. Their benchmark data is some of the best available on what is actually happening in mainstream organizations, segmented by industry sector and organization size. These are not models, but statistical reports based on confidential survey responses by many of the largest firms in North America.

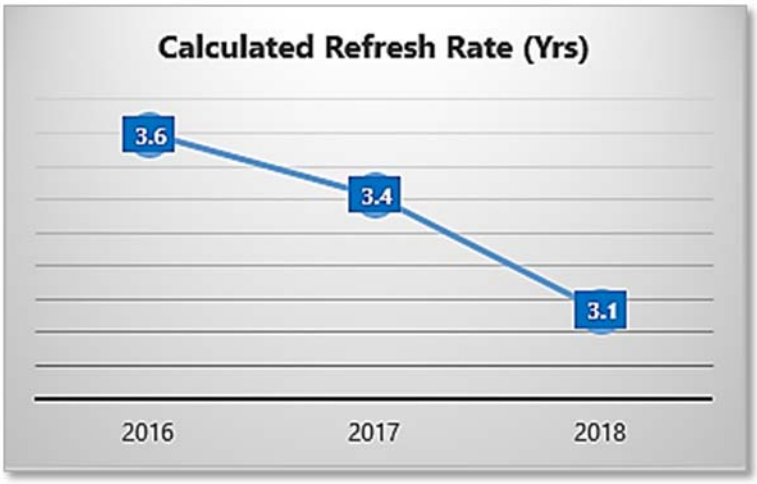
There are two specific metrics for us to note here: Estimated Refresh Rates for mid-size ($500M to a little over $800M in revenue) and larger organizations; and actual Annual per User PC/device Spend.

- Estimated Refresh Rates: Computer Economics (CE) introduced a new survey question on refresh cycles in 2013, wording the question in terms of 'estimated refresh rates'. This was not a calculated number, a policy standard, nor a record of actual refresh spend. For firms (all industries) in the both size brackets, there has been no change in the median value since 2013. The median response to this question has been 4.0 years for the period 2013-2018. CE explains that they do not use *averages* (due to outlier problems), but rather *medians*. They give this definition: "The median is the halfway point. Half of the response values fall below this level and the other half above." What a 4.0 median means is that 50% of all survey respondents refreshed their systems in less than 4 years and the other half in more than 4 years. The fact that there has been no change in this metric indicates that firms have not seen adequate reason to move refresh rates UP or DOWN.

- Annual per User PC/device Spend: This metric tells a different story. This is a statistical number, reporting what these firms actually spend on PC/laptop/endpoint devices each year, per user. These figures can be used to approximate a finer-grained estimate of actual refresh rates. For example, if the yearly spend is $250, and we use $1,000 for an endpoint price, then this would indicate a refresh rate of 4 years ($1,000 divided by $250).

Here are the data elements for the last 3 years of the survey, and the approximate refresh rate as a trend line for **mid-size organizations**:

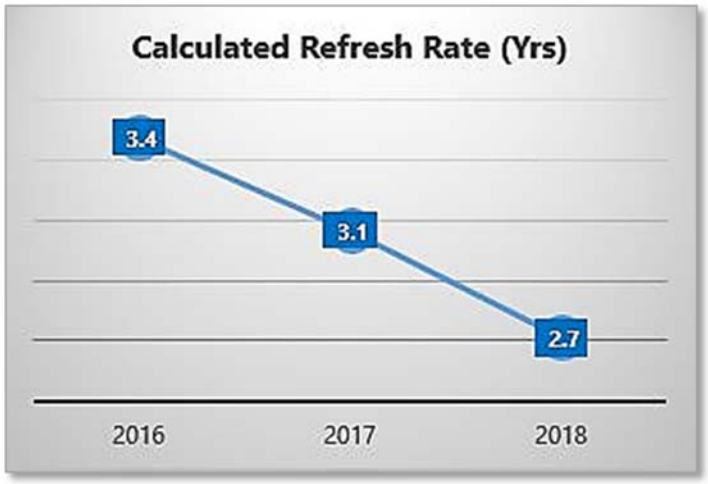
Year	Yearly Spend
2016	$278
2017	$293
2018	$326



This data – a 15% drop from 2016 to 2018 -- would suggest that endpoint refresh cycles were shortening, instead of lengthening—in the practice of these organizations.

For **larger organizations**, the data indicates a larger decline in lifespans (20% drop from 2016 to 2018), and since larger firms often invest more heavily in technology, the refresh cycles are even shorter than those for mid-size firms:

Year	Yearly Spend
2016	$296
2017	$326
2018	$369



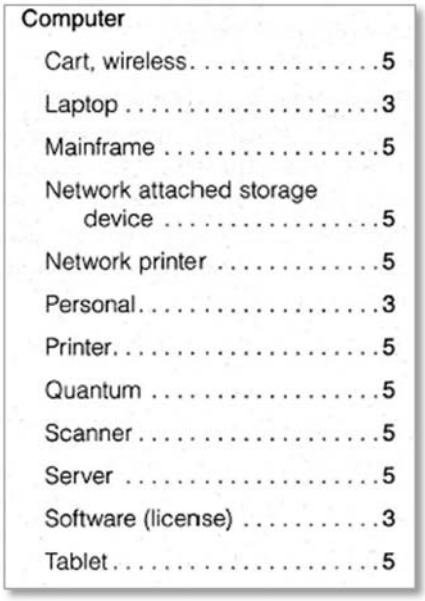
This data would suggest that endpoint refresh cycles were shortening, instead of lengthening—in the practice of large and mid-size organizations[1].

TWO: Updated useful life guidelines by the American Hospital Association

The American Hospital Association (AHA) publishes the *Estimated Useful Lives of Depreciable Hospital Assets* document every few years. Changes in technology asset life spans are recorded in those documents, for use in Medicare reimbursement. The AHA book is updated every 4-5 years, with the most recent one being released in 2018.

In all editions from 2004 through the present one (i.e. 2004, 2008, 2013, 2018), computers used for administrative purposes have always had a 3 year estimated useful life. (Laptops on carts and in other diagnostic systems generally are assigned 5 year useful lives, as are tablets).

Here is the chart from the 2018 edition[2].



Since healthcare is increasingly dependent on endpoint reliability for healthcare delivery, the fact that refresh cycles were not lengthened would suggest that the 3 year cycle was still the most appropriate—irrespective of any improvements in the underlying technologies in the devices.

THREE: Data from the IRS internal guidelines

The US Internal Revenue Service [IRS Code of 1986, Section 168(e)(3)(b)(iv)[3]] specifies that the economic life (meaning depreciation period) of computers (laptops, desktops, servers) is 5 years.

In spite of this, the internal policy of the IRS itself as published in the IRM (Internal Revenue Manual) focuses on 'useful life' instead of 'economic life' [IRM 1.35.6.10 (4)[4], *Part 1. Organization, Finance, and Management; Chapter 35. Financial Accounting; Section 6. Property and Equipment Accounting; Sub-section 10. Property and Equipment Capitalization; Paragraph 4*]:

> "4. The useful life of an asset is the normal operating life in terms of utility to the owner. Estimates of useful life consider factors such as physical wear and tear and technological changes that bear on the economic usefulness of the asset."

And they set the term for end-user computers at 3 years in the next paragraph [IRM 1.35.6.10 (5)]:

5. The following chart summarizes the threshold value and useful life for each type of IRS property and equipment:

EQUIPMENT	THRESHOLD VALUE	USEFUL LIFE
Mainframe Computer System	No threshold	7 years
Server		7 years
Laptop and Desktop		3 years
Telecommunications Equipment		7 years

That section (*Property and Equipment Capitalization*) was revised in July 2016, and reviewed for changes in late 2018.

Given a somewhat fiscally conservative policy of the US administration, the fact that the refresh rate was not lengthened in the 2016 update, nor revised upward in the 2018 review, would suggest that there were no compelling reasons to try to stretch the lifespan.

FOUR: Latest data we have on laptop failure rates

It is almost impossible to get failure rate data from the manufacturers, and only service/repair firms and advocacy groups gather and report such data. The most recent data we have is from *Consumer Reports*, from winter of 2017, although this data reflects consumer experience rather than exclusively commercial usage[5].

They published statistics for laptop failure rates by the end of the 2nd year of ownership for HP, Dell, and Lenovo, for 2015 and winter 2017. The average failure rate INCREASED from 14% to 21% of units, which is an increase of 47.4%. This would strongly suggest that laptop equipment is NOT getting more reliable.

To argue that that trend had reversed and that laptop reliability was BETTER now would require some actual data from the recent period. In the absence of such data, there is no warrant for assuming improved laptop reliability as a factor in favor of lengthening refresh cycles. [Reliability MIGHT have improved, of course, but without any evidence of that it would not be prudent to base decisions upon that possibility.]

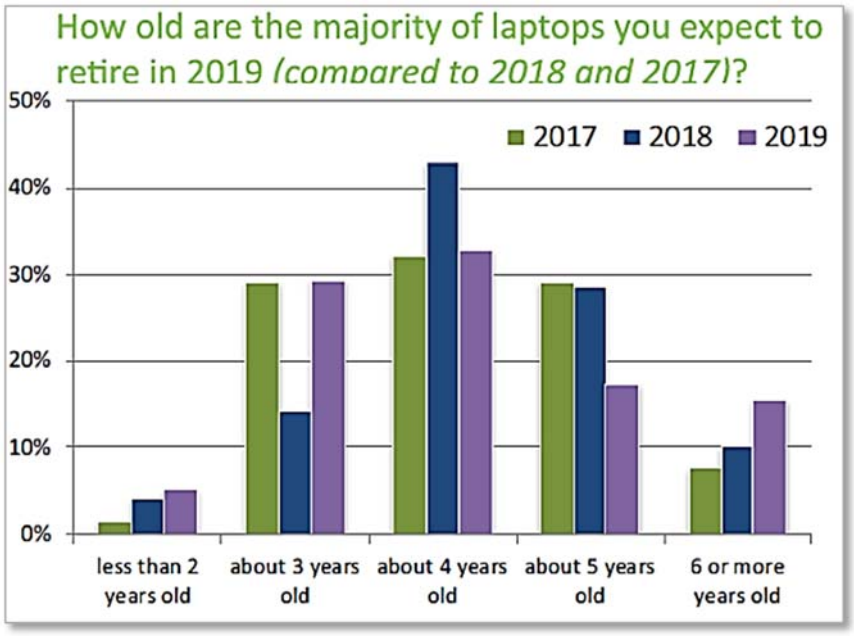
FIVE: Laptop replacement plans

One other source of data comes from the asset management services sector (ITAD, ITAM). These groups often see replacement cycles first-hand, since they are often trusted to remove the older equipment as the new comes in.

One such group – Cascade Asset Management – surveys their client base and analyses the equipment they receive, in order to assess future replacement plans.

The most recent benchmark survey is dated to 2019, and is called *IT Asset Disposition Trends and Best Practices*, 2019 Edition[6].

Within that report is this chart:



And their observations are important for our analysis:

> "For laptops, the **refresh rate is shortening**. Respondents expect 67.2% of retired laptops to be 4 years old or less, compared to 61.2% in 2018 and 63.0% in 2017. **Financial/Banking firms and companies providing IT services/software have the fastest laptop refresh rates**." [Emphasis added.]

This is broadly in line with the other data points discussed above, as well as with the body of historical data.

Summary: Not Much Change

The earlier studies combined with the recent data discussed above constitute a large body of accumulated experience, and an IT finance manager would be wise to question any suggestion (by either IT or Finance personnel) that "we are much better at this than the rest of the world". Business plans that assert that they will not incur the significant costs, risks, and disadvantages of a slower refresh rate should be given extra scrutiny and should be required to produce historical evidence that they will be an exception. This is simply prudence and good risk management on the part of those who bear responsibility for IT investments.

We hope this information provides some useful input for your clients' decisions on this. There are other variables which might require professional accounting/tax/legal advice, but the factors above are the general starting points for many of our clients.

Outreach Support Team, Huntington Technology Finance (May 2019)

Notes:

1. *IT Spending & Staffing Benchmarks*, published by Computer Economics, for years 2-13-2018. Available with paid subscription at https://www.computereconomics.com/
2. *Estimated Useful Lives of Depreciable Hospital Assets, Revised 2018 Edition*. Published by the American Hospital Association. Health Forum Inc., Chicago (2018). Page 10.
3. Assessable at https://www.law.cornell.edu/uscode/text/26/168, with the definition of 'qualified technological equipment' at *26 USC 168(i)(2)(A)* assessable at https://www.law.cornell.edu/uscode/text/26/168#i_2_A
4. Assessable at https://www.irs.gov/irm/part1/irm_01-035-006#idm140511628331216
5. *2017 Winter Product Reliability Survey*, Consumer Reports National Research Center. (Similar for 2015 data).
6. *IT Asset Disposition Trends and Best Practices, 2019 Edition*. Assessable at https://www.cascade-assets.com/2019Report (requires registration).